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**Patent and Trademark Office**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/653,281 08/31/00 BEAMAN

K M4065.0278/P

EXAMINER

MM91/1101

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BOOTH B

ART UNIT

PAPER NUMBER

2812  
DATE MAILED:

11/01/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/653,281

Applicant(s)

BEAMAN ET AL.

Examiner

Richard A. Booth

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) 46-51 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_ 6) ☐ Other: \_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

Applicant's election without traverse of group II in Paper No. 6 is acknowledged.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

~~The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.~~

Claims 5, 20, and 35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In the above claims, the use of the word "targeted" when referring to a "targeted thickness" is not understood. It seems like if the targeted thickness is not reached, then more time should be given for the process. Clarification is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1, 6, 16, 21, 31, and 36 are rejected under 35 U.S.C. 102(e) as being anticipated by Chang et al., U.S. Patent 6,162,684.

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Chang et al. shows the invention as claimed including forming a tunnel oxide layer 42 over a substrate 40; forming a first conductor layer 44 over the tunnel oxide 42; forming an insulating layer over the first conductor layer, the insulating layer comprising a first oxide layer, a nitride layer formed by annealing in ammonia, and a second oxide layer formed by oxidizing said nitride layer in an atmosphere of diatomic hydrogen and oxygen (see column 5, lines 20-61); forming a second conductor layer 48 over the insulating layer; etching at least the first conductor, second conductor, and insulating layers to define the stacked structure (see Figure 2F); and implanting to form source/drain regions 66,70 (see Figure 2H).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-5, 11-15, 17-20, 26-30, 32-35, and 41-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al., U.S. Patent 6,162,684.

Chang et al. is applied as above but lacks anticipation of the time and temperatures and thicknesses of formation of the second oxide, and the use of either a single, batch, rapid thermal, or fast ramp system.

The times and temperatures and thicknesses overlap with the times and temperatures and thicknesses in the reference and thus a prima facie case of

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obviousness has been established (see MPEP 2144.05). With respect to the particular apparatus used to perform the process, official notice is taken that all of the above apparatus are well known in the art and would be obvious to use for the process of Chang et al.. For instance, batch apparatus allow for higher throughput, and RTP or fast ramp systems allow for a minimal thermal budget.

Claims 7-10, 22-25, and 37-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al., U.S. Patent 6,162,684 as applied to claims 2-5, 11-15, 17-20, 26-30, 32-35, and 41-45 above, and further in view of Neely et al., U.S. Patent 5,443,863.

Chang et al. is applied as above but lacks anticipation of forming the second oxide layer through photoexcitation or using ozone or in a microwave environment.

Neely et al. discloses decomposing ozone under the presence of microwaves in order to promote oxidation (see abstract). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the second oxide layer in Chang et al. using the process taught by Neely et al. because this will reduce the thermal budget of the process of Chang and reduce the chances of thermal damage.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard A. Booth whose telephone number is 308-3446. The examiner can normally be reached on Monday-Thursday from 7:30-6:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on 308-3325. The fax phone numbers for the organization where this application or proceeding is assigned are 308-7724 for regular communications and 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-1782.



Richard A. Booth  
Primary Examiner  
Art Unit 2812